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New records of the water mite family Hygrobatidae from Australia, with the description of ten new species (Acari: Hydrachnidia)

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Abstract – Five new *Australiobates* species are described, *viz. A. crassisetus, A. hygrobatoides, A. minutipalpis, A. planisetus* and *A. tenuisetus*. Furthermore, three new *Procorticacarus* species are described, *viz. P. fonticolus, P. mixtus* and *P. piriformis*. Finally, one new *Rhynchaustrobates* species and one new *Coaustraliobates* species are described, *viz. R. stylatus* and *C. rostratus*. *Kallimobates cooki* is synonymized with *K. australicus*. The male of *Hygrobates australicus* and the females of *Aspidiobates wittenoom* and *Gondwanabates bodivus* are described for the first time. *Australiobates convexipalpis* is reported for the first time for Australia. Many new records are given for a number of species of the water mite family Hygrobatidae, especially for the Northern Territory and Western Australia. Finally, the diversity of the Australian water mites is briefly discussed.

INTRODUCTION

The water mite family Hygrobatidae is represented in Australia by 17 genera (Harvey, 1998), of which 14 are endemic to the Australian region (Australia, New Guinea, New Zealand and New Caledonia). The family occurs mainly in streams and hyporheic habitats, where some species can occur in large numbers, e.g. *Kallimobates australicus* K.O. Viets in streams in montane eastern Australia. In ponds and lakes *Coaustraliobates minor* (Lundblad) occurs in large numbers (this study).

In this paper the results are presented of collections made in Victoria, Tasmania, Northern Territory and Western Australia. New species are described for the genera *Australiobates, Coaustraliobates, Procorticacarus* and *Rhynchaustrobates*. In addition, many new records are given, including records new for the fauna of Australia, especially for the Northern Territory and Western Australia.

MATERIAL AND METHODS

All material has been collected by the author. Victorian holotypes and paratypes have been deposited in the Museum of Victoria, Melbourne (NMV), those of the Northern Territory in the Northern Territory Museum, Darwin (NTM). Holotypes and paratypes from Western Australia have been deposited in the Western Australian Museum, Perth (WAM). Furthermore, paratypes and all non-type material have been deposited in the Zoological Museum of the University of Amsterdam (ZMAN).

The following abbreviations have been used: Pl = palp segment 1 (trochanter); IV-leg-4 = fourth segment of fourth leg (tibia of fourth leg); V4 = ventroglandularia 4. All measurements are in µm; measurements of leg and palp segments are of the dorsal margins. Measurements of paratypes in the description of new species are given in brackets. When the number of specimens reported in the literature is low, additional measurements are given.

SYSTEMATICS

Hygrobates Koch

Hygrobates Koch, 1837: 8.

Hygrobates australicus Cook

Figure 1

Hygrobates australicus Cook, 1986: 85; Smit, 1996a: 18; Wiles, 1997b: 408; Harvey, 1998: 140.

Material Examined

Australia: Northern Territory: 2 ♂, 3 ♀, Douglas River near Douglas Hot Springs, 1 August 1994.

Description

Male

Body 608–632 long and 478–518 wide. Chelicera 200 long, cheliceral claw 68 long. Genital field 170 in width and 130 in length; three pairs of acetabula (Figure 1). Dorsal lengths of Pl-PV: 18, 74, 70, 134, 34; palp as in female. Dorsal lengths of I-leg-4-6:

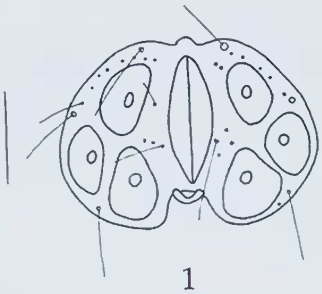


Figure 1 *Hygrobates australicus*, genital field ♂. Scale line = 50 µm.

126, 142, 108. Dorsal lengths of IV-leg-4-6: 182, 190, 142.

Remarks

This is the first description of the male. The species is known from Queensland and Waigeo (New Guinea, Indonesia), and is reported here for the first time for the Northern Territory.

Hygrobates hamatus Viets

Hygrobates hamatus Viets, 1935: 617; Cook, 1986: 84; Wiles, 1990: 280; Smit, 1992: 95; Gledhill and Wiles, 1997: 521; Wiles, 1997b: 408; Harvey, 1998: 140.

Hygrobates hamatus bharatensis Cook, 1967: 95; Lundblad, 1969: 341; Lundblad, 1971: 330; Prasad, 1974: 60.

Material Examined

Australia: Northern Territory: 7 ♂, 2 ♀, 1 nymph, Radon Springs, Kakadu National Park, 19 July 1994; 1 ♀, pond Jim Jim Creek, near Jim Jim campground, Kakadu National Park, 23 July 1994; 20 ♂, 7 ♀, 1 nymph, Kambolgie Creek, Kakadu National Park, 26 July 1994; 1 ♀, Lily Ponds Falls, Katherine Gorge National Park, 27 July 1994; 7 ♂, 5 ♀, 1 nymph, 17 Mile Creek (tributary of Katherine River), Katherine Gorge National Park, 28 July 1994; 1 ♂, Katherine River, near visitors center, Katherine Gorge National Park, 28 July 1994; 6 ♂, 1 ♀, 1 nymph, pond Chinaman Creek, 16 km south of Katherine, 29 July 1994. **Western Australia:** 6 ♂, 6 ♀, Bell Creek at campground, The Kimberley, 11 September 1998; 2 ♀, stream El Questro Gorge, El Questro Homestead, The Kimberley, 15 September 1998; 3 ♂, 5 ♀, plunge pool Emma Gorge, The Kimberley, 16 September 1998.

Remarks

A widespread species, previously reported from Australia, Indonesia (including New Guinea), India and Sri Lanka. Gledhill and Wiles (1997) synonymized *H. h. bharatensis* with the nominate form. Within Australia, the species was known from Queensland, and is reported here for the first time for the Northern Territory and Western Australia.

Australiobates Lundblad

Australiobates Lundblad, 1941: 116.

Remarks

The genus *Australiobates* has a typical Gondwanan distribution, occurring in all southern landmasses (Wiles, 1997a; Harvey, 1998). So far, there are 34 reported species, in two subgenera. From Australia 12 species are known, nine from New Guinea and five from New Zealand, all belonging to the subgenus *Australiobates*. The species from New Zealand (especially the males) are quite distinct, as they have an increased number of setae on PIII. Many species from New Guinea exhibit strong secondary sclerotization (Wiles, 1997a).

Australiobates (Australiobates) crassisetus sp. nov.

Figures 2–4

Material Examined

Holotype

♀, Lily Creek Lagoon, Kununurra, Western Australia, Australia, 17 September 1998 (WAM).

Paratypes

Australia: Western Australia: 1 ♀, same data as holotype (ZMAN); 1 ♀, Jack's Waterhole (along Gibb River Road), The Kimberley, 14 September 1998 (WAM).

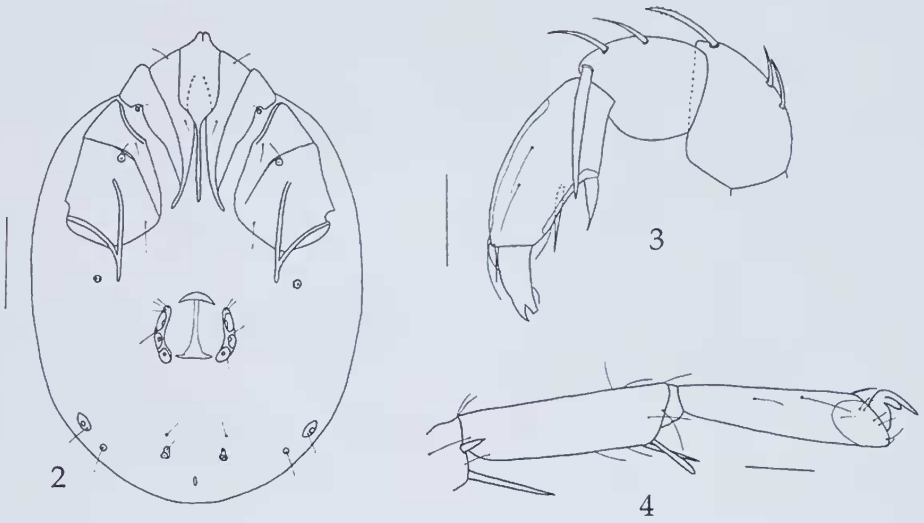
Diagnosis

Palp stocky, ventral margin of PIV with thickened setae.

Description

Female

Body 980 (1004–1085) long, 737 (729–818) wide. Suture line between third and fourth coxal plates complete or almost complete (Figure 2). Chelicere not measurable; cheliceral claw 92 long. Three pairs of acetabula. One paratype with three acetabula on one side, and two on the other. Genital field 158 long and 194 wide. V4 posterior of genital field; V2 anterior of excretory pore. Lengths of PI-PV: 30, 82, 74, 102, 41. Palp stocky, especially PIV. This last segment with one very thick seta on the ventral margin (Figure 3). Ventral margin of PIII convex, PIII with two long dorsodistal setae, which reach to posterior margin of PIV; ventral seta of PV blunt.



Figures 2–4 *Australiobates crassisetus*, holotype ♀: 2, ventral view; 3, palp; 4, I-leg-4-6. Scale lines = 200 μm (Figure 2), 50 μm (Figures 3–4).

Lengths of I-leg-4-6: 148, 150, 132; I-leg-5 ventrodistally with one blunt and one pointed seta (Figure 4). Lengths of IV-leg-4-6: 227, 251, 174. II-leg-5, III-leg-5 and IV-leg-5 with two swimming setae.

Male

Unknown.

Remarks

There are no other species which have a similar thick seta on the ventral margin of PIV. Moreover, all but one Australian species with swimming setae have a hair-like seta on the ventral margin of PIV.

Etymology

Named for the thickened setae on the ventral margin of PIV.

Australiobates (Australiobates) convexipalpis Wiles

Australiobates convexipalpis Wiles, 1997a: 170.

Material Examined

Australia: Northern Territory: 1 ♂, small stream Butterfly Gorge, Katherine Gorge National Park, 27 July 1994.

Remarks

A species widely distributed in the lowland streams of New Guinea (Wiles, 1997a), reported here for the first time for Australia.

Australiobates (Australiobates) hygrobatoides sp. nov.

Figures 5–7

Material Examined

Holotype

♀, Glenisla River, at crossing with Red Rock Road, Grampians National Park, Victoria, Australia, 29 September 1997 (NMV).

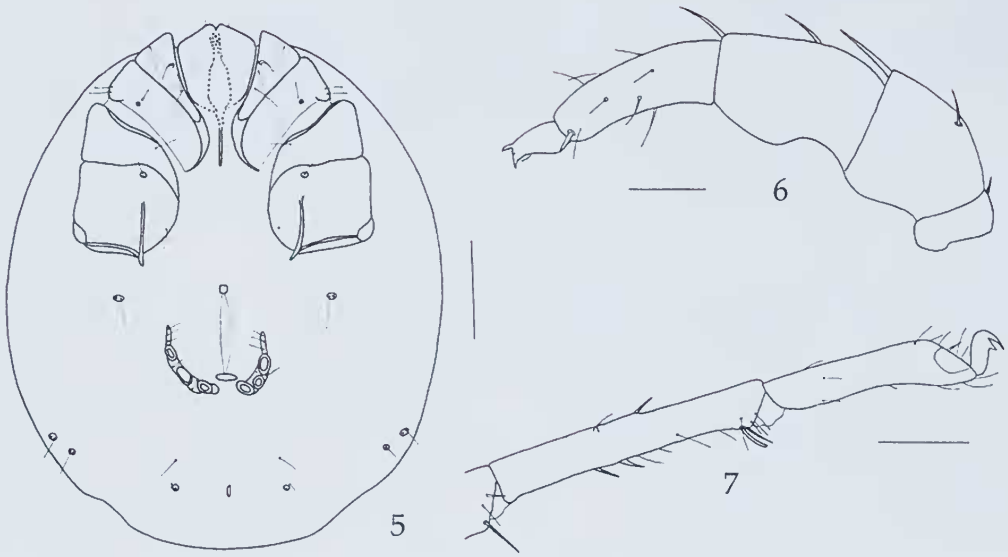
Diagnosis

PIII convex, separation of capitulum and coxal plates indistinct, posterior process of capitulum very narrow.

Description

Female

Body 1012 long and 883 wide. Separation of capitulum and coxal plates indistinct. Posterior process of capitulum very narrow. Ventral part of capitulum covered with minute spines. Apodemes of fourth coxal plates short, ending just beyond posterior margin of fourth coxal plates (Figure 5). Genital field 223 long and 227 wide; anterior of acetabula a row of three setae. V4 anterior of genital field. Lengths of PI-PV: 44, 114, 110, 146, 46. Ventral margin of PIII convex, PIII with a relative short dorsodistal seta (Figure 6); ventral margin of PIV with a hair-like setae. Lengths of I-leg-4-6: 320, 308, 176; I-leg-5 with one pointed and one blunt seta (Figure 7). Lengths of IV-leg-4-6: 421, 454, 251; IV-leg-5 with a rudimentary swimming seta.



Figures 5–7 *Australiobates hygrobatoides*, holotype ♀: 5, ventral view; 6, palp; 7, I-leg-4-6. Scale lines = 200 µm (Figure 5), 50 µm (Figure 6), 100 µm (Figure 7).

Male

Unknown.

Remarks

No other *Australiobates* species has a similar palp, especially the shape of PIII is unusual for the genus. Moreover, all but one Australian species with a hair-like seta on the ventral margin of PIV have distinct swimming setae.

Etymology

The name refers to the resemblance of the new species to members of the genus *Hygrobates*, i.e. the indistinct separation of the capitulum and coxal plates.

Australiobates (Australiobates) linderi Lundblad

Australiobates linderi Lundblad, 1941: 116.

Australiobates (Australiobates) linderi Lundblad: Lundblad, 1947: 50; Cook, 1986: 91; Smit, 1992: 96; Harvey, 1998: 139.

Material Examined

Australia: Victoria: 1 ♀, Buckland River at crossing with Buckland Valley Road, west of Bright, 11 October 1997; 1 ♂, 1 ♀, Shipwreck Creek, Croajingolong National Park, 23 October 1997; 1 ♂, 4 ♀, Betka River at crossing with Stony Creek Road, south-west of Genoa, 24 October 1997. **Northern Territory**: 1 ♀, Radon Springs, Kakadu National Park, 19 July 1994; 2 ♀, Baboalba Springs (Gubarra), Kakadu National Park, 20 July 1994; 1 ♂, pool Twin Falls, Kakadu National Park, 23 July 1994; 8 ♂, 8 ♀, Barramundie Creek, Kakadu National Park, 24 July 1994; 3 ♀, Kambolgie Creek, Kakadu National Park, 26 July 1994; 4 ♂, 6 ♀, Outlet Upper Pool Edith Falls, Katherine Gorge National Park, 30 July 1994. **Western Australia**: 1 ♀, Bell Creek at crossing with Gibb River Road, The Kimberley, 10 September 1998; 2 ♀, Bell Creek at campground, The Kimberley, 11 September 1998; 3 ♀, Pentecost River at El Questro Station, The Kimberley, 15 September 1998; 3 ♀, Zebedee Springs (hot springs), El Questro Homestead, The Kimberley, 16 September 1998; 4 ♀, Ord River at Ivanhoe Crossing, near Kununurra, 18 September 1998.

Remarks

The species has been reported from eastern and southern Australia. It is reported here for the first time for the Northern Territory and Western Australia. The species has a variable chaetotaxy of PIV and the legs. As pointed out earlier (Smit, 1992), the peg-like setae on the ventral margin are usually blunt, occasionally pointed. However, it seems that this character is dependent of the angle they are seen. The distance between these two setae is also variable, often they are located very close to each other. All specimens of this study have I-leg-5 with one blunt and one pointed seta, but occasionally more legs have blunt setae. I cannot find any differentiating characters, and assigned all to *A. linderi*. The best character by which to identify this species is the shape of PIII, which has a slightly

to distinctly bulging distal part, and the presence of hair-like, sometimes more thickened setae on the ventral margin.

Australiobates (Australiobates) minutipalpis sp. nov.

Figures 8–10

Material Examined

Holotype

♂, Barramundie Creek, Kakadu National Park, Northern Territory, Australia, 24 July 1994 (NTM).

Paratypes

Australia: Northern Territory: 2 ♂, 1 ♀, (NTM), 1 ♂, 1 ♀, same data as holotype (ZMAN).

Diagnosis

Palp very short, especially PIV and PV; PIII with long dorsodistal setae.

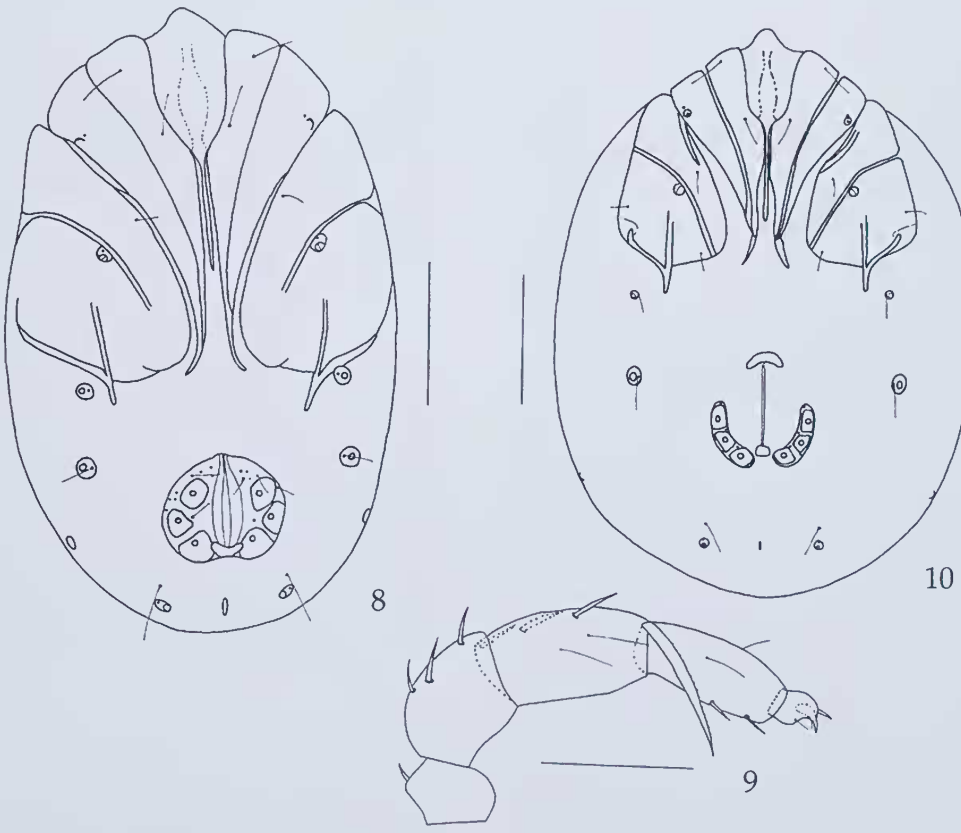
Description

Male

Body ventrally 429 long (405–417), dorsally 364 long (332–348), 275 wide (267–284). Suture line between third and fourth coxal plates incomplete. Posterior apodemes of fourth coxal plates long (Figure 8). Chelicera 157 long, cheliceral claw 46 long. Genital field 72 long and 92 wide. Three pairs of acetabula. V4 located anteriorly of genital field. Lengths of PI-PV: 16, 46, 58, 50, 18. Palp very short, especially PIV and PV. Setae on ventral margin of PIV peg-like; PIII with long dorsodistal setae (Figure 9). Lengths of I-leg-4-6: 80, 76, 66; I-leg-5 ventrodistally with short setae. Lengths of IV-leg-4-6: 142, 156, 116.

Female

Body 867 long and 672 wide. Posterior apodemes of fourth coxal plates long (Figure 10). Chelicere 258 long, cheliceral claw 70 long. Genital field 170 long and 160 wide. Three pairs of acetabula. V4



Figures 8–10 *Australiobates minutipalpis*, holotype ♂: 8, ventral view; 9, palp; 10, ventral view, paratype ♀. Scale lines = 200 µm (Figure 8–10), 50 µm (Figure 9).

located anteriorly of genital field. Lengths of PI-PV: 20, 76, 90, 80, 30; palp as in male. Lengths of I-leg-4-6: 126, 126, 104. Lengths of IV-leg-4-6: 198, 238, 170. IV-leg-5 with one rudimentary swimming seta.

Remarks

The very short palp, especially PIV and PV, is not found in any other species. Moreover, all other known species with enlarged dorsodistal setae of PIII, have hair-like setae on the ventral margin of PIV.

Etymology

Named for its very short palp.

Australiobates (Australiobates) mutatus K.O. Viets

Australiobates mutatus K.O. Viets, 1978b: 79.

Australiobates (Australiobates) mutatus K.O. Viets: Cook, 1986: 94; Smit, 1992: 96; Harvey, 1998: 139.

Material Examined

Australia: Tasmania: 2 ♂, 1 ♀, unnamed creek 2.5 km off Tasman Highway, at crossing with Rosendale Road, Bicheno, 19 October 1997; 5 ♂, 1 ♀, Douglas River at crossing with Tasman Highway, 20 October 1997. **Victoria:** 7 ♂, 3 ♀, Glenelg River at crossing with Siphon Road, Grampians National Park, 29 September 1997; 9 ♂, 10 ♀, Glenisla River at crossing with Red Rock Road, Grampians National Park, 29 September 1997; 1 ♀, Fyans Creek at crossing with Grampians Tourist Road, 30 September 1997; 4 ♂, 2 ♀, Billimina Creek, Grampians National Park, 30 September 1997; 2 ♀, 2 nymphs, MacKenzie River at Zumstein, Grampians National Park, 1 October 1997; 1 ♀, Ovens River at Wangaratta, 9 October 1997; 1 ♀, Running Jump Creek, Mt Buffalo National Park, 10 October 1997; 1 ♂, 3 ♀, unnamed creek The Long Plain, Mt Buffalo National Park, 10 October 1997; 2 ♂, 3 ♀, Buckland River at crossing with Buckland Valley Road, west of Bright, 11 October 1997; 1 ♀, Shipwreck Creek, Croajingolong National Park, 23 October 1997; 1 ♂, Betka River at crossing with Stony Creek Road, south-west of Genoa, 24 October 1997. **Northern Territory:** 6 ♂, 3 ♀, 3 nymphs, Barramundie Creek, Kakadu National Park, 24 July 1994; 20 ♂, 19 ♀, 5 nymphs, South Alligator River, 11 km east of Gunlom, Kakadu National Park, 26 July 1994; 1 ♀, Kambolgie Creek, Kakadu National Park, 26 July 1994; 1 ♀, Katherine River near visitors center, Katherine Gorge National Park, 28 July 1994; 2 ♂, 2 ♀, Outlet Upper Pool Edith Falls, Katherine Gorge National Park, 30 July 1994. **Western Australia:** 1 ♂, 3 ♀, small stream near pool upstream of Bell Gorge Falls, The Kimberley, 11 September 1998.

Remarks

So far, the species was known from Tasmania to Queensland. These are the first records for the Northern Territory and Western Australia. As already mentioned by Cook (1986), there is a considerable variation in size. My largest female specimen (from Billimina Creek) is 1239 long and 1045 wide. This is much larger than the largest female of Cook (1986), which was 851 long. As all intermediate measurements can be found, and all are structurally similar, I consider all specimens to belong to one single species.

Australiobates (Australiobates) neolinderi Cook

Australiobates neolinderi Cook, 1986: 92.

Australiobates (Australiobates) neolinderi Cook: Harvey, 1998: 139.

Material Examined

Australia: Tasmania: 5 ♀, Nive River at crossing with Lyell Highway, 14 October 1997; 3♂, 6 ♀, Apsley River at crossing with Tasman Highway, 19 October 1997; 1 ♀, unnamed creek 2.5 km off Tasman Highway, at crossing with Rosendale Road, Bicheno, 19 October 1997.

Remarks

An endemic Tasmanian species.

Australiobates (Australiobates) planisetus sp. nov.

Figures 11–13

Material Examined

Holotype

♀, South Alligator River, 11 km east of Gunlom, Kakadu National Park, Northern Territory, Australia, 26 July 1994 (NTM).

Paratype

Australia: Northern Territory: 1 ♀, same data as holotype (ZMAN).

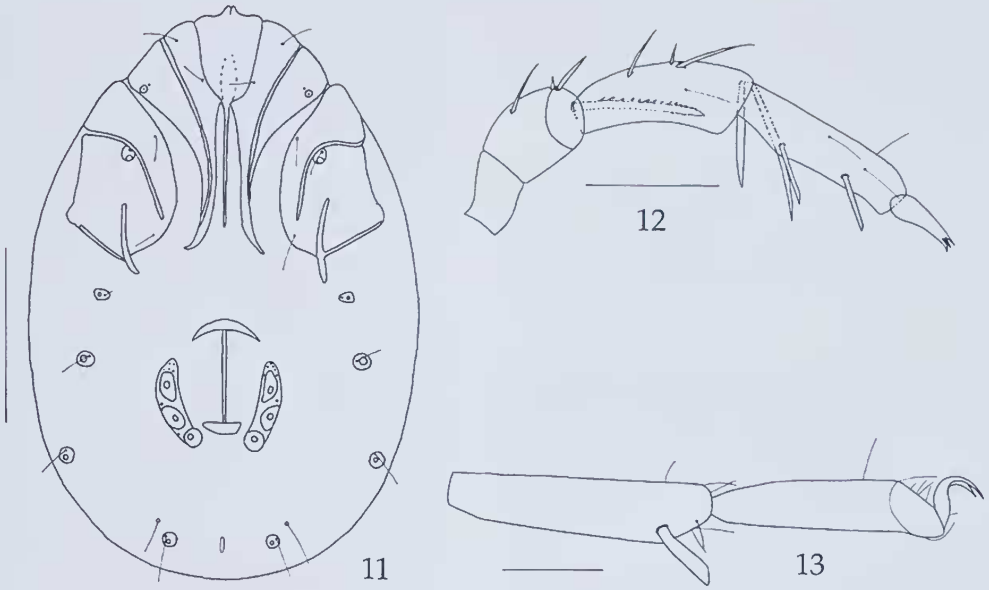
Diagnosis

I-leg-5, II-leg-5 and III-leg-5 with enlarged, flattened setae; ventral margin of PIV with peg-like setae, which end distally with a bevelled edge.

Description

Female

Body 608 (559) long and 454 (425) wide. Suture lines of third and fourth coxal plates nearly complete. Apodemes of fourth coxal plates of moderate length (Figure 11). Genital field 142 long and 146 wide. Three pairs of acetabula. V4 located laterally of genital field. Dorsal lengths of PI-PV: 28,



Figures 11–13 *Australiobates planisetus*, holotype ♀: 11, ventral view; 12, palp; 13, I-leg-5-6. Scale lines = 200 µm (Figure 11), 50 µm (Figures 12, 13).

44, 67, 76, 26. PII dorsodistally with a long serrated seta, PIII with long dorsodistal setae. Ventral margin of PIV with peg-like setae, which end distally with a bevelled edge (Figure 12). Dorsal lengths of I-leg-4-6: 117, 126, 94. Dorsal lengths of IV-leg-4-6: 200, 224, 148; IV-leg-5 with two rudimentary swimming setae. I-leg-5, II-leg-5 and III-leg-5 with one enlarged, flattened seta and one pointed seta (Figure 13).

Male

Unknown.

Remarks

Australiobates queenslandensis has somewhat similar setae on the distal end of the first leg, although they are not as large as in the new species. However, *A. queenslandensis* has hair-like setae on the ventral margin of PIV, in the new species these setae are peg-like. *A. longiseta* Wiles from New Guinea has a similar palp with long dorsodistal seta of PIII, but PIV is stockier, and the dorsodistal setae of PIII are extending beyond the posterior margin of PIV.

Etymology

Named for the flattened setae of PIII.

Australiobates (Australiobates) queenslandensis Cook

Australiobates queenslandensis Cook, 1986: 88.

Australiobates (Australiobates) queenslandensis Cook: Harvey, 1998: 139.

Material Examined

Australia: Northern Territory: 1 ♀, pool Twin Falls, Kakadu National Park, 23 July 1994; 1 ♀, pond Jim Jim Creek, near Jim Jim campground, Kakadu National Park, 23 July 1994; 1 ♀, plunge pool Barramundie Creek, Kakadu National Park, 24 July 1994; 1 ♀, pools upstream of Waterfall Creek, Kakadu National Park, 25 July 1994; 1 ♂, Katherine River near visitors center, Katherine Gorge National Park, 28 July 1994; 1 ♀, pond Chinaman Creek, 16 km south of Katherine, 29 July 1994. **Western Australia:** 2 ♀, pool Joffre Gorge, Hamersley Range National Park, 13 August 1994; 1 ♀, pond Hancock Gorge, Hamersley Range National Park, 14 August 1994; 1 ♂, Fitzroy River at crossing with Great Northern Highway, south of Derby, 8 September 1998; 2 ♀, pool Lennard Gorge, Windjana Gorge National Park, 9 September 1998; 1 ♀, pools 3 km from Lennard Gorge, The Kimberley, 10 September 1998; 1 ♂, 1 ♀, pool Lennard Gorge, The Kimberley, 10 September 1998; 1 ♀, plunge pool Adcock Gorge, The Kimberley, 12 September 1998; 1 ♀, Lily Creek Lagoon, Kununurra, 17 September 1998; 1 ♀, Palm Springs, south of Halls Creek, 25 September 1998; 2 ♀, pool Saw Pit Gorge, south of Halls Creek, 25 September 1998; 3 ♀, pools in creek at Old Halls Creek, south of Halls Creek, 26 September 1998.

Remarks

The species has previously been reported only

from Queensland. It is reported here for the first time from the Northern Territory and Western Australia. There is one character not mentioned by Cook (1986): V4 are located posteriorly of the genital field.

Australiobates (Australiobates) rudagus Cook

Australiobates rudagus Cook, 1986: 95.

Australiobates (Australiobates) rudagus Cook: Harvey, 1998: 139.

Material Examined

Australia: Northern Territory: 5 ♀, South Alligator River, 11 km east of Gunlom, Kakadu National Park, 26 July 1994; 2 ♀, Katherine River near visitors center, Katherine Gorge National Park, 28 July 1994. **Western Australia:** 3 ♀, Ord River at Ivanhoe Crossing, near Kununurra, 18 September 1998.

Remarks

This species has previously been described only from Queensland. Therefore, the new records from the Northern Territory and Western Australia represent a considerable range extension. My specimens have a slight to distinct convex PIII, which is not present in the specimens from Queensland. However, all have the distinctive heavy peg-like seta of the ventral margin of PIV. The largest female from this study measured 959 in length and 769 in width. V4 is located laterally of the genital field.

Australiobates (Australiobates) tenuisetus sp. nov.
Figures 14–15

Material Examined

Holotype

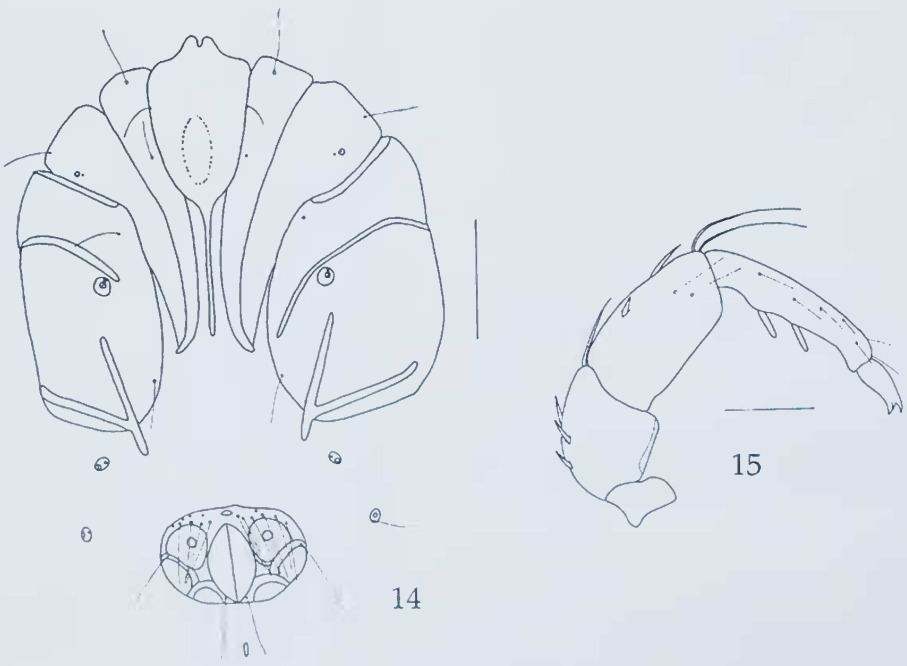
♂, South Alligator River, 11 km east of Gunlom, Kakadu National Park, Northern Territory, Australia, 26 July 1994 (NTM).

Paratypes

Australia: Northern Territory: 2 ♂ (NTM), 1 ♂ (ZMAN), same data as holotype; 2 ♂, Katherine River at visitors center, Katherine Gorge National Park, 28 July 1994 (ZMAN).

Diagnosis

PIII with long, thin dorsodistal setae; peg-like setae on ventral margin of PIV relatively thick.



Figures 14–15 *Australiobates tenuisetus*, holotype ♂: 14, ventral view; 15, palp. Scale lines = 200 µm (Figure 14), 50 µm (Figure 15).

Description

Male

Body dorsally 437 (429–478) long and ventrally 478 (486–522); width of body 364 (364–405). Suture lines between third and fourth coxal plates incomplete to almost complete (Figure 14). Posterior apodemes of fourth coxal plates relatively short. Genital plates with three pairs of acetabula; genital field with long setae. Lengths of PI-PV: 23, 86, 92, 114, 33. PIII with two setae on medial side, ventral margin without setae. PIII with two long, thin dorsodistal setae, reaching almost halfway PIV (Figure 15). Ventral margin of PIV with two thickened, peg-like setae, which are rounded apically. Lengths of I-leg-4-6: 148, 158, 118; dorsodistal setae of I-leg-5 of normal shape. Lengths of IV-leg-4-6: 219, 220, 162. Legs without swimming setae, only rudimentary setae are present.

Female

Unknown.

Remarks

Few other Indo-Australian *Australiobates*-species have a combination of peg-like setae on the ventral margin of PIV and long dorsodistal setae of PIII. The New Guinean *A. longiseta* Wiles and *A. reticulata* Wiles share this combination with the new species (Wiles, 1997a). PIV of *A. longiseta* is much stockier, and the dorsodistal seta of PIII extends beyond the posterior margin of PIV. *A. reticulata* has PIV with long, pointed peg-like setae, while the setae of the genital field are very short. The Australian *A. rudagus* Cook also has thickened peg-like setae on the ventral margin of IV, but these are much thicker. Moreover, *A. rudagus* has PIII with short dorsodistal seta.

Etymology

The species is named for its long, thin dorsodistal setae of PIII.

Australiobates (Australiobates) ventriscutatus Cook

Australiobates ventriscutatus Cook, 1986: 90.

Australiobates (Australiobates) ventriscutatus Cook: Harvey, 1998: 139.

Material Examined

Australia: Western Australia: 1 ♂, pond Kalamina Gorge, near falls, Hamersley Range National Park, 13 August 1994.

Remarks

The species is widespread in eastern Australia, and has been reported from Tasmania, Victoria, New South Wales and Queensland. This is the first record from Western Australia, and represents a considerable range extension of the species.

Australiobates (Australiobates) violaceus Lundblad

Australiobates violaceus Lundblad, 1941: 116.

Australiobates (Australiobates) violaceus Lundblad: Lundblad, 1947: 49; Cook, 1986: 87; Harvey, 1998: 139.

Material Examined

Australia: Tasmania: 1 ♀, Little Pine Lagoon, SW of Great Lake, 18 March 1981, leg. D.R. Cook (slide DC 31 81, NMV); 1 ♂, Douglas River, south of St Marys, 8 March 1981, leg. D.R. Cook (slide DC 11 81, NMV); 1 ♀, Nive River at crossing with Lyell Highway, 14 October 1997; 1 ♂, 2 ♀, Apsley River at crossing with Tasman Highway, 19 October 1997. **Victoria:** 1 ♀, Crystal Brook, Hospice Plain, Mt Buffalo National Park, 10 October 1997. **Northern Territory:** 1 ♂, pond Jim Jim Creek, near Jim Jim campground, Kakadu National Park, 23 July 1994; 1 ♀, Barramundie Creek, Kakadu National Park, 24 July 1994.

Remarks

There are some characters which are not mentioned by previous authors. I-leg-5 has one (rather short) swimming seta, II-leg-5, III-leg-5 and IV-leg-5 have two long swimming setae. Cook (1986) mentioned only the two swimming setae of IV-leg-5, but in two specimens from his collection examined by me, two swimming setae are present on legs II-III. The coxal plates of both males and females have a reticulate pattern. V4 located posteriorly of genital field. The largest male I collected is 931 long and 705 wide, the females are up to 1507 long and 1215 wide. These measurements are much larger compared with those of Cook (1986). The species has been reported previously from Tasmania, New South Wales and Queensland. The species is reported here for the first time for Victoria and the Northern Territory.

Coaustraliobates Cook

Australiobates (*Coaustraliobates*) Cook, 1974: 210.

Coaustraliobates Cook: Cook, 1986: 101.

Coaustraliobates longipalpis (Lundblad)

Australiobates longipalpis Lundblad, 1941: 116; Lundblad, 1947: 52.

Coaustraliobates longipalpis (Lundblad): Cook, 1986: 101; Wiles, 1997a: 178; Wiles, 1997b: 409; Harvey, 1998: 140.

Material Examined

Australia: Western Australia: 1 ♀, pond Kalamina Gorge (near falls), Hamersley Range National Park, 13 August 1994.

Remarks

The species is known from Australia (Tasmania, Victoria) and New Guinea, and is reported here for the first time for Western Australia. *C. longipalpis* is much less common compared to *C. minor*.

Coaustraliobates minor (Lundblad)

Australiobates longipalpis var. *minor* Lundblad, 1947: 53.

Australiobates longipalpis minor Lundblad: Viets, 1969: 71.

Coaustraliobates minor (Lundblad): Cook, 1986: 102; Smit, 1992: 96; Wiles, 1997a: 178; Wiles, 1997b: 409.

Material Examined

Australia: Tasmania: 9 ♂, 4 ♀, swamp 12 km S of Gladstone, along road B82, 20 October 1997; 1 ♂, 1 ♀, Windmill Lagoon, St Helens, 20 October 1997; 1 ♂, 1 ♀, Jocks Lagoon, S of St Helens, 20 October 1997. **Victoria**: 1 ♂, Double Creek, Croajingolong National Park, 23 October 1997; 2 ♀, Shipwreck Creek, Croajingolong National Park, 23 October 1997; 2 ♀, unnamed creek W of Secret Beach, Mallacoota, 23 October 1997; 1 ♂, 1 ♀, unnamed creek 4.5 km E of Shipwreck Creek, Croajingolong National Park, 23 October 1997. **Northern Territory**: 2 ♂, Radon Springs, Kakadu National Park, 19 July 1994; 2 ♂, 5 ♀, 4 nymphs, Lake Jabiru, Jabiru, 20 July 1994; 2 ♂, 2 ♀, 2 nymphs, Baboalba Springs (Gubarra), Kakadu National Park, 20 July 1994; 2 ♂, 1 nymph, pond in Jim Jim Creek at Jim Jim Crossing, Kakadu National Park, 22 July 1994; 6 ♂, 7 ♀, pool near Jim Jim Falls, Kakadu National Park, 23 July 1994; 1 ♀, 1 nymph, pond Jim Jim Creek, near Jim Jim campground, Kakadu National Park, 23 July 1994; 2 ♂, 1 nymph, Barramundie Creek, Kakadu National Park, 24 July 1994; 5 ♂, 17 ♀, 2 nymphs, plunge pool Barramundie Creek, Kakadu National Park, 24 July 1994; 4 ♂, 2 ♀, 2 nymphs, plunge pool Gunlom Falls, Kakadu National Park, 25 July 1994; 4 ♂, 4 ♀, 2 nymphs, pools upstream of Waterfall Creek, Kakadu National Park, 25 July 1994; 1 ♀, Kambolgie Creek, Kakadu National Park, 26 July 1994; 1 ♂, 3 ♀, 1 nymph, Southern Rockhole, Katherine Gorge National Park, 27 July 1994; 8 ♂, 6 ♀, pond Chinaman Creek, 16 km S of Katherine, 29 July 1994; 1 ♂, 1 nymph, Manton Dam, 1 August 1994; 1 ♂, 2 ♀, Douglas River, at Douglas Hot Springs, 1 August 1994; 11 ♂, 3 ♀, waterhole Ormiston Gorge, Ormiston Gorge National Park, 6 August 1994. **Western Australia**: 2 ♂, 8 ♀, 2 nymphs, Fortescue Falls (pool), Hamersley Range National Park, 11 August 1994; 2 ♂, 2 ♀, pond Dales Gorge, Hamersley Range National Park, 12 August 1994; 1 ♀, pond Knox Gorge, Hamersley Range National Park, 13 August 1994; 4 ♂, 9 ♀, 7 nymphs, pond Kalamina Gorge (near falls), Hamersley Range National Park, 13 August 1994; 1 ♀, Palm Pool, Millstream-Chichester National Park, 15 August 1994; 1 ♀, small pond near Crossing Pool, Millstream-Chichester National Park, 16 August 1994; 1 ♂, pond Snake Creek, Millstream-Chichester National Park, 17 August 1994; 1 ♀, Jones River E of Roeburne, 17 August 1994; 3 ♂, 4 ♀, Fortescue River at crossing with highway, 18 August 1994; 3 ♂, 2 ♀, Cockatoo Creek, at crossing with Great Northern Highway, 8 September 1998; 1 ♀, Fitzroy River, at crossing with Great Northern Highway, south of Derby, 8 September 1998; 1 ♂, pool Lennard River, Windjana Gorge National Park, 9 September 1998; 2 ♂, 6 ♀, pool Lennard River (east side), Windjana Gorge National Park, 10 September 1998; 7 ♂, 4 ♀, 1 nymph, pool Lennard Gorge, The Kimberley, 10 September 1998; 3 ♀, pools 3 km from Lennard Gorge, The Kimberley, 10 September 1998; 2 ♂, 8 ♀, pool Silent Grove, behind ranger station, The Kimberley, 11 September 1998; 1 ♂, pools upstream of Bell Gorge Falls, The Kimberley, 11 September 1998; 3 ♂, 10 ♀, Bell Creek, at campground, The Kimberley, 11 September 1998; 2 ♀, pool Silent Grove Spring, The Kimberley, 11 September 1998; 2 ♂, 4 ♀, pool Galvans Gorge, The Kimberley, 12 September 1998; 2 ♀, plunge pool Adcock Gorge, The Kimberley, 12 September 1998; 2 ♂, 6 ♀, 2 nymphs, pool Manning Gorge Falls, The Kimberley, 13 September 1998; 4 ♂, 8 ♀, Jack's Waterhole (along Gibb River Road), The Kimberley, 14 September 1998; 1 ♀, Zebedee Springs (hot springs), El Questro Station, The Kimberley, 16 September 1998; 1 ♂, Lily Creek Lagoon, Kununurra, 17 September 1998; 2 ♀, 1 nymph, pool Valentine Springs, west of Kununurra, 18 September 1998; 5 ♂, 4 ♀, Lake Kununurra, 10 km south-east of Kununurra, 19 September 1998; 29 ♂, 40 ♀, 2 nymphs, Spillway Creek, near Lake Argyle, 20 September 1998; 1 ♀, plunge pool The Grotto, S of Wyndham, 20 September 1998; 5 ♀, Arthur Creek, at crossing with Great Northern Highway, 23 September 1998; 2 ♂, 4 ♀, plunge pool Cathedral Gorge, Purnululu National Park, 24 September 1998; 1 ♀, Palm Springs, south of Halls Creek, 25 September 1998; 1 ♂, pool Saw Pit Gorge, south of Halls Creek, 25 September 1998; 1 ♂, pools at Old Halls Creek, south of Halls Creek, 26 September 1998; 4 ♂, Geikie Gorge, western part, Geikie Gorge National Park, The Kimberley, 28 September 1998; 7 ♂, 14 ♀, 1 nymph, Fitzroy River, south of Fitzroy Crossing, 28 September 1998; 10 ♂, 16 ♀, 2 nymphs, pools west of Tunnel Creek, Tunnel Creek National Park, 30 September 1998.

Remarks

A widespread species, known from Australia, New Caledonia and New Guinea. Within Australia the species is common and reported from almost every state, but the species is reported here for the first time for Western Australia. Specimens with leg segments larger than the measurements given by Cook (1986) can be found. For males for example the following measurements were made for I-leg-4-6: 283, 332, 304 and for IV-leg-4-6: 421, 458, 397.

Coaustraliobates rostratus sp. nov.

Figures 16–17

Material Examined

Holotype

♀, Billimina Creek, Grampians National Park, Victoria, Australia, 30 September 1997 (NMV).

Diagnosis

The rostriform palp is diagnostic for the new species.

Description

Female

Body 802 long and 599 wide. Suture line of third and fourth coxal plates incomplete; coxoglandularia 4 located posteriorly of medial end of these suture lines. Apodemes of fourth coxal plates short (Figure 16). Genital field 146 long and 188 wide. Three pairs of acetabula. Dorsal lengths of PI-PV: 40, 74, 98, 195, 46. PIV very slender, contracted distally and therefore rostriform (Figure 17). Dorsal lengths of I-leg-4-6: 138, 154, 128. Dorsal lengths of IV-leg-4-6: 230, 258, 212. II-leg-5, III-leg-5 and IV-leg-5 with two swimming setae.

Male

Unknown.

Remarks

The unusual shape of the palp easily distinguishes the new species from the three known species of the genus.

Etymology

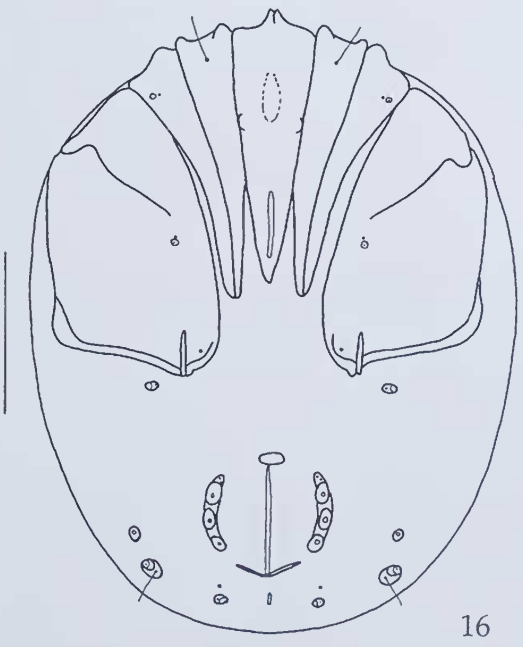
Named for its rostriform palp.

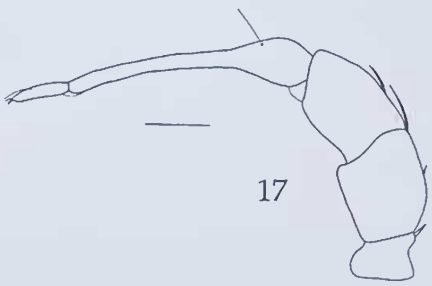
Groonabates Cook

Groonabates Cook, 1986: 132.

Groonabates stanopus Cook

Groonabates stanopus Cook, 1986: 132; Harvey, 1998: 140.





Figures 16–17 *Coaustraliobates rostratus*, holotype ♀: 16, ventral view; 17, palp. Scale lines = 100 µm (Figure 16), 50 µm (Figure 17).

Material Examined

Australia: Tasmania: 5 ♀, stream downstream of Russel Falls, Mt Field National Park, 17 October 1997; 2 ♀, unnamed creek at crossing with Rosendale Road, 2.5 km off Tasman Highway, Bicheno, 19 October 1997.

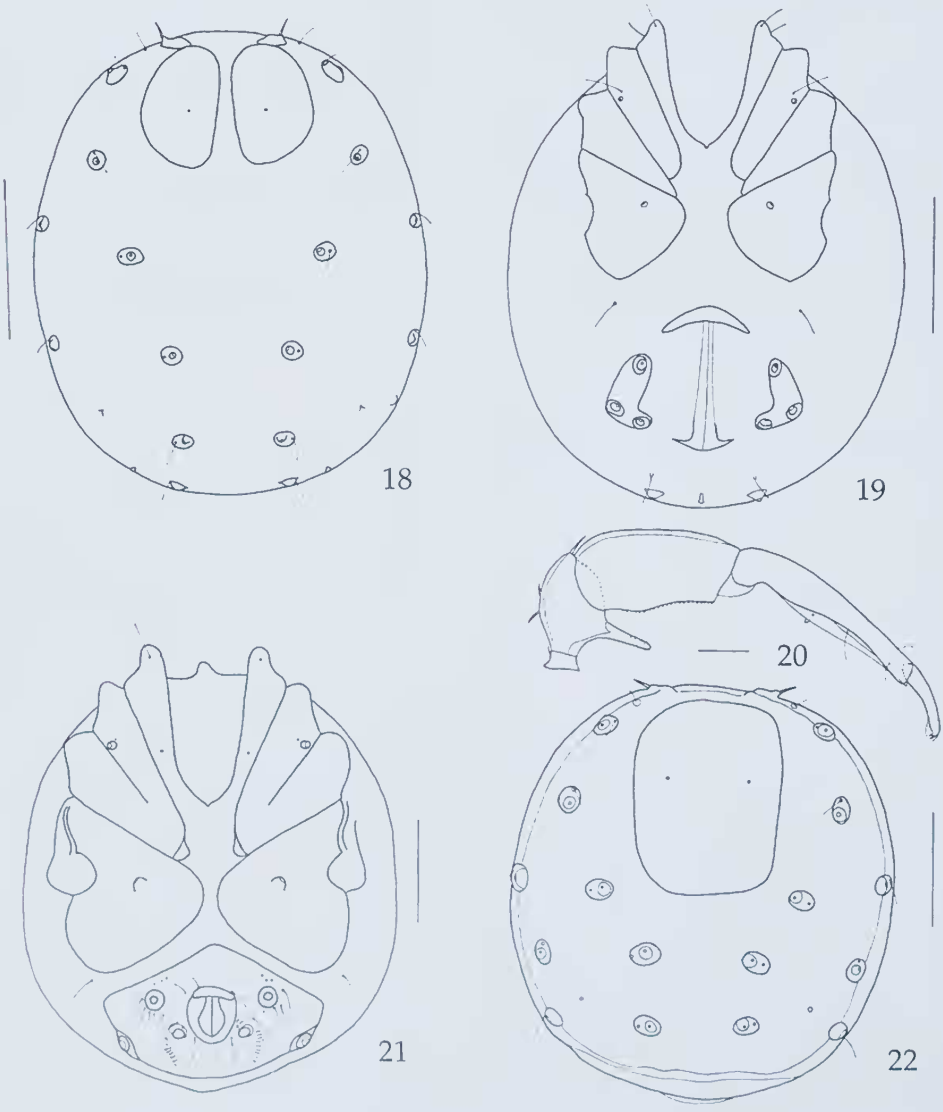
Remarks

Groonabates stanopus is endemic to Tasmania. Additional characters are the lineated integument and the slightly sinuous-shaped PIV.

Procorticacarus K.O. Viets

Corticacarus (Procorticacarus) K.O Viets, 1978b: 267.

Harvey (1998) and Cramer and Cook (1998) raised the subgenus *Procorticacarus* to the ranking of a full genus. So far, the genus has been reported from eastern and south-western Australia and New Guinea (Wiles, 1991, 1994; Harvey, 1998). In total, nine species are known from New Guinea and 18 species are known from Australia. In my collection there is one specimen from the Millstream-



Figures 18–22 *Procorticacarus fonticolus*: 18, dorsal view, holotype ♀; 19, ventral view, holotype ♀; 20, palp, holotype ♀; 21, ventral view, paratype ♂; 22, dorsal view, paratype ♂. Scale lines = 200 µm (Figures 18, 19), 50 µm (Figure 20), 100 µm (Figures 21, 22).

Chichester National Park (Western Australia), far outside the known range of the genus. Unfortunately, the specimen is very young, and therefore not described here.

Procorticacarus angulicoxalis (K.O. Viets)

Corticacarus (Procorticacarus) angulicoxalis K.O. Viets, 1978c: 269; Cook, 1986: 147.

Procorticacarus angulicoxalis (K.O. Viets): Harvey, 1998: 140.

Material Examined

Australia: Victoria: 2 ♀, Ovens River at Wangaratta, 9 October 1997; 3 ♀, Ovens River at Porepunkah, 9 October 1997; 1 ♀, Eurobin Creek, at park entrance, Mt Buffalo National Park, 11 October 1997; 1 ♀, Buckland River at crossing with Buckland Valley Road, W of Bright, 11 October 1997.

Remarks

A widespread species, previously reported from Tasmania, Victoria and New South Wales (Cook, 1986).

Procorticacarus fonticolus sp. nov.
Figures 18–22

Material Examined

Holotype

♀, Ingleton Springs, Grampians National Park, Victoria, Australia, 30 September 1997 (NMV).

Paratypes

1 ♂ (young specimen, not well sclerotized), 3 ♀ (NMV), 3 ♀ (ZMAN), same data as holotype.

Diagnosis

Palp long and slender, female with two postocularia plates, male with one postocularia plate which is longer than wide; glandularia of fourth coxal plates of male located in the middle.

Description

Male

Body dorsally 359 long and 335 wide, ventrally 427 long. Integument with fine papillae arranged in a reticulate pattern, especially on postocularia plate. Postocularia plate longer than wide, somewhat rectangular in shape, but plate not well sclerotized and shape therefore difficult to ascertain (Figure 22); postocularia situated in the middle of plate. Glandularia plates of dorsum of moderate size. Capitular bay deep. First coxal plates fused. Glandularia on fourth coxal plates situated in the middle. Gland portion of coxoglandularia 2 absent. Three pairs of acetabula, posterior acetabulum separated by more than a diameter of an acetabulum from other two (Figure 21). Lengths of PI-PV: 26, 72, 114, 140, 60; palp as in female. Lengths of I-leg-4-6: 92, 106, 86. Lengths of IV-leg-4-6: 152, 156, 114.

Female

Body dorsally 575 (470-591) long and 494 wide, ventrally 624 long. Integument with fine papillae arranged in a reticulate pattern, especially on postocularia plates. Two postocularia plates present, 140 long and 96 wide (Figure 18). Glandularia plates of dorsum of moderate size. Capitular bay deep. First coxal plates fused. Gland portion of coxoglandularia 2 absent. Three pairs of acetabula (Figure 19). Lengths of PI-PV: 25, 88, 154, 189, 76; palp very long and slender (Figure 20). Ventral margin of PII with a large projection, tip covered with fine papillae; PIII ventrally with small papillae; PIV ventrally with a hyaline margin, peg-like setae inserted in this hyaline margin, proximal of the middle of this segment. Lengths of I-leg-4-6: 118, 110, 104. Lengths of IV-leg-4-6: 170, 186, 124.

Remarks

The new species is very close to *P. longipalpis* (Cook), which has a similar long and slender palp. However, the male of *P. longipalpis* has a postocularia plate which is wider than long, while the female has only one postocular plate. Moreover, the glandularia on the fourth coxal plates of the male are located near the posterior margin, while they are located in the middle in *P. fonticolus*. Other species which a similar slender palp differ in the number of acetabula or in the shape of PII.

Etymology

Named for its occurrence in a spring.

Procorticacarus hirsutus (K.O. Viets)

Corticacarus (Procorticacarus) hirsutus K.O. Viets, 1978c: 272; Cook, 1986: 148.

Procorticacarus hirsutus (K.O. Viets): Harvey, 1998: 140.

Material Examined

Australia: Victoria: 1 ♀, Ovens River at Porepunkah, 9 October 1998.

Remarks

A widespread species, known from Tasmania, Victoria and New South Wales.

Procorticacarus longipalpis (Cook)

Corticacarus (Procorticacarus) longipalpis Cook, 1986: 149.

Procorticacarus longipalpis (Cook): Harvey, 1998: 140.

Material Examined

Australia: Tasmania: 1 ♀, stream downstream of Russel Falls, Mt Field National Park, 17 October 1997; 1 ♀, Douglas River, at crossing with Tasman Highway, 20 October 1997. Victoria: 1 ♀, Billimina Creek, Grampians National Park, 30 September 1997.

Remarks

Previously only reported from Tasmania.

Procorticacarus mixtus sp. nov.
Figures 23–25

Material Examined

Holotype

♀, Shipwreck Creek, Mallacoota, Croajingolong National Park, Victoria, Australia, 23 October 1997 (NMV).

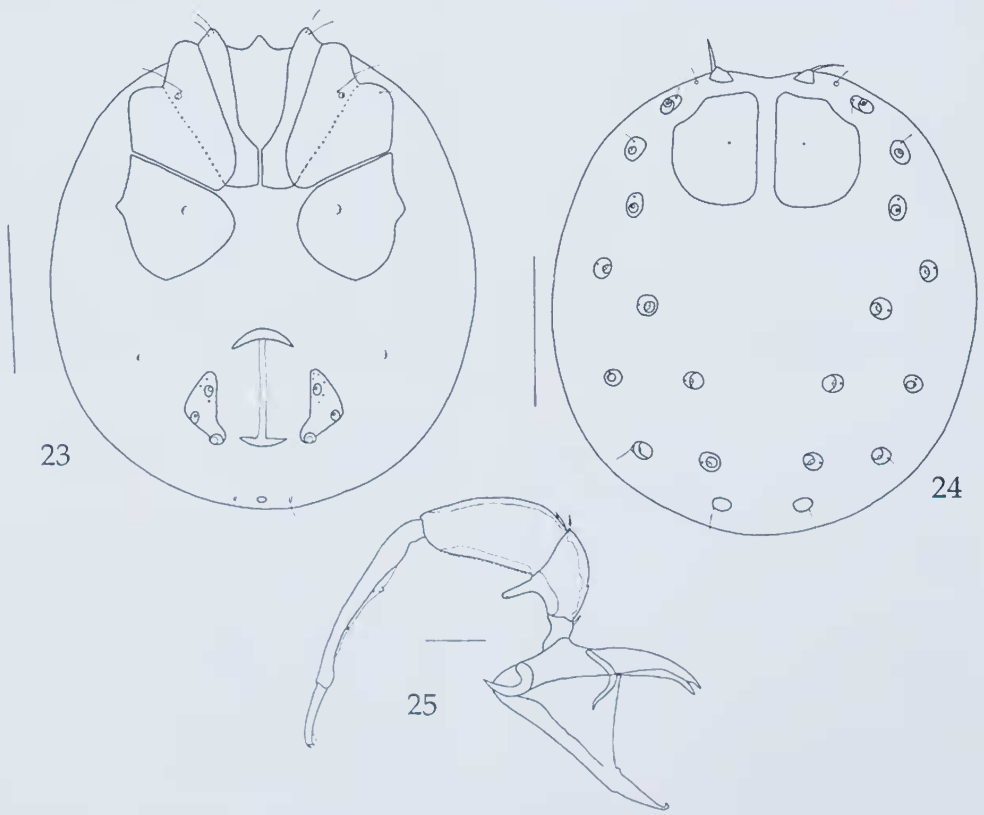
Diagnosis

Palp very slender; dorsum with two postocularia plates; first of four pairs of glandularia posteriorly of postocularia plates much further apart than second pair.

Description

Female

Body 640 long and 567 wide; dorsum 583 long. Integument with numerous fine papillae. Dorsum with two large postocularia plates (Figure 24), 144 long and 132 wide, postocularia located in the middle of plate; anterolateral corner of postocularia plates indented. First of four pairs of glandularia posteriorly of postocular plates much further apart than second pair. Capitular bay deep. Chelicera 252 long, cheliceral claw 61 long. First coxal plates separated medially; fourth coxal plates rounded medially. Genital field somewhat triangular, with 3 pairs of acetabula (Figure 23). Dorsal lengths of PI-PV: 32, 104, 167, 226, 70. Palp very slender especially PIV and PV; PIII ventrally with numerous papillae (Figure 25). PII with a large ventral projection, the top with fine papillae. Dorsal



Figures 23–25 *Procorticacarus mixtus*, holotype ♀: 23, ventral view; 24, dorsal view; 25, palp. Scale lines = 200 µm (Figures 23, 24), 50 µm (Figure 25).

lengths of I-leg-4-6: 134, 130, 96. Dorsal lengths of IV-leg-4-6: 182, 190, 140.

Male
Unknown.

Remarks
The configuration of the dorsal glandularia and the shape of the postocularia plates is similar to that of *P. australicus* K.O. Viets. However, the palp of the last species is rather stocky. Other species with a slender palp differ in having only one postocularia plate (*P. longipalpis*) or in different shaped postocularia plates and a different configuration of the dorsal glandularia (*P. fonticolus* sp. nov.).

Etymology
The name of the species refers to the combination of characters found also in other species.

Procorticacarus pachydermis (Cook)

Corticacarus (Procorticacarus) pachydermis Cook, 1986: 144.

Procorticacarus pachydermis (Cook): Harvey, 1998: 140.

Material Examined
Australia: Tasmania: 1 ♀, stream downstream of Russel Falls, Mt Field National Park, 17 October 1997. **Victoria**: 1 ♀, Ovens River at Porepunkah, 9 October 1997; 1 ♂, 1 ♀, West Kiewa River, 11 km upstream of Mount Beauty (near power station), 12 October 1997.

Remarks
Previously only reported from Tasmania. The specimens from Victoria have much larger acetabula compared to those of Tasmania. However, as discussed under *P. victorianus*, the acetabula size can be variable. Therefore, no new taxon has been described, and all specimens are assigned to *P. pachydermis*.

Procorticacarus piriformis sp. nov.
Figures 26–28

Material Examined

Holotype
♀, Growler Creek, Wilsons Promontory National Park, Victoria, Australia, 27 October 1997 (NMV).

Diagnosis
Genital field with 6 pairs of acetabula. Dorsum with a large, pear-shaped postocularia plate.

Description

Female
Body 650 long and 601 wide. Integument with numerous fine papillae. Dorsum with a large pear-shaped postocularia plate, 432 long and 369 wide (Figure 27). Platelets associated with glandularia enlarged, gland openings slit-like. Capitular bay U-shaped, very deep. Chelicere 310 long. First coxal plates separated. Coxoglandularia 2 absent. Gonopore large, 136 long. Extensive secondary sclerotization posteriorly of fourth coxal plates. Six pairs of acetabula on an indistinct genital plate; medial three pairs separated from lateral three pairs (Figure 26). Lengths of PI-PV: 31, 118, 127, 204, 55. PII with a long ventral projection; ventral margin of PIII smooth; peg-like setae of ventral margin of PIV well separated, large and situated proximally (Figure 28). Dorsal length of I-leg-4: 104 (other segments lost). Dorsal lengths of IV-leg-4-6: 146, 154, 113.

Male
Unknown.

Remarks
All but one Indo-Australian members of the genus have less than four pairs of acetabula. Only *P. mcgrathae* (Wiles) from New Guinea has 4–6 pairs of acetabula, but differs from the new species in the configuration of the dorsal plates and glandularia platelets. The new species shares the slit-like gland openings with other species, e.g. *P. cooki* (Imamura) and *P. cranerae* (Cook).

Etymology
Named for its pear-shaped postocularia plate.

Procorticacarus prasadi (Cook)

Corticacarus (Procorticacarus) prasadi Cook, 1986: 145.

Procorticacarus prasadi (Cook): Harvey, 1998: 140.

Material Examined
Australia: Tasmania: 1 ♀, stream downstream of Russel Falls, Mt Field National Park, 17 October 1997.

Remarks
Only known from Tasmania.

Procorticacarus victorianus (K.O. Viets)

Corticacarus (Procorticacarus) victorianus K.O. Viets, 1978c: 271.

Corticacarus (Procorticacarus) victoriensis (laps. pro *C. victorianus* K.O. Viets): Cook, 1986: 150.

Procorticacarus victorianus (K.O. Viets): Harvey, 1998: 141.

Material Examined

Australia: Victoria: 5 ♀, Ovens River at Porepunkah, 9 October 1997; 4 ♀, Eurobin Creek, at park entrance, Mount Buffalo National Park, 11 October 1997.

Remarks

The acetabula of most of my specimens are much larger than illustrated by Viets (1978b). However, the size of the acetabula is variable and within some specimens a considerable variation can be found. The species has been reported from Victoria and New South Wales.

Dropursa Cook

Dropursa Cook, 1986: 97.

Dropursa babinda Cook

Dropursa babinda Cook, 1986: 100; Wiles, 1997a: 179; Wiles, 1997b: 409; Harvey, 1998: 140.

Material Examined

Australia: Northern Territory: 1 ♀, 17 Mile Creek (tributary of Katherine River), Katherine Gorge National Park, 28 July 1994. **Western Australia:** 1 ♂, 1 ♀, small stream near pools upstream of Bell Gorge Falls, The Kimberley, 11 September 1998.

Remarks

Known from Queensland (only from type locality) and New Guinea. Within Australia, the new records mean a considerable range extension, but fit well in the distribution pattern.

Dropursa boultoni Cook

Dropursa boultoni Cook, 1986: 99; Harvey, 1998: 140.

Material Examined

Australia: Northern Territory: 1 ♀, 1 nymph, plunge pool Barramundie Creek, Kakadu National Park, 24 July 1994; 1 ♀, pools upstream of Waterfall Creek, Kakadu National Park, 25 July 1994; 1 ♂, plunge pool Gunlom Falls, Kakadu National Park, 25 July 1994; 1 ♂, 2 ♀, plunge pool

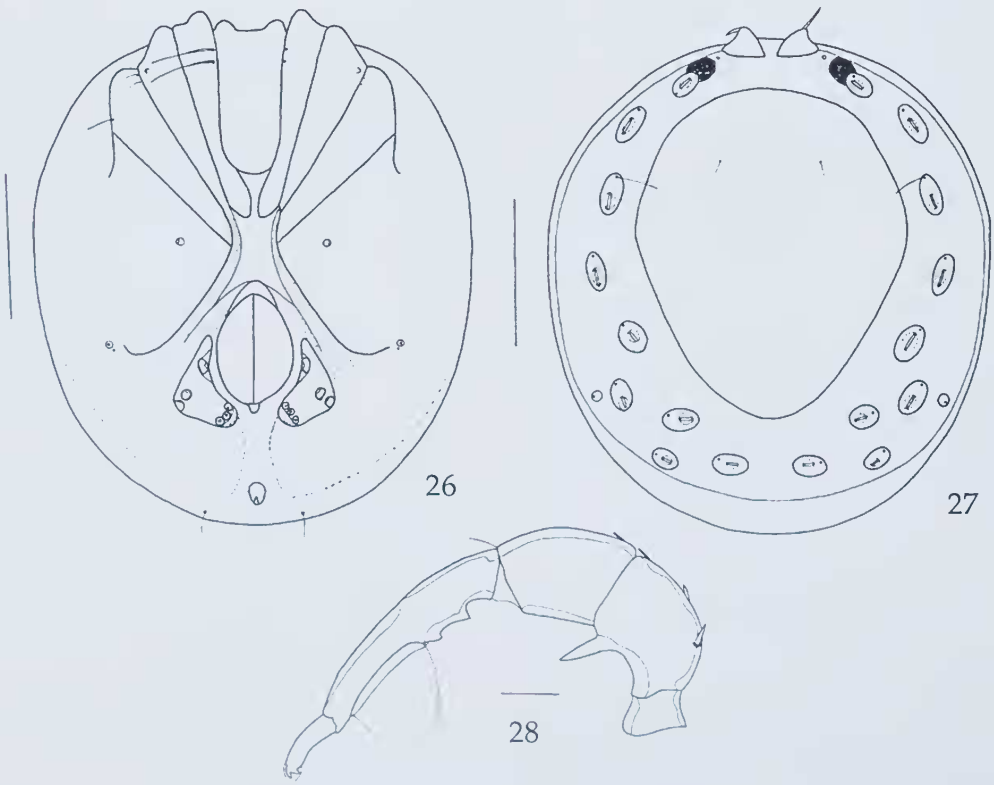


Figure 26–28 *Procorticacarus piriformis* holotype ♀: 26, ventral view; 27, dorsal view; 28, palp. Scale lines = 200 µm (Figures 26, 27), 50 µm (Figure 28).

Edith Falls, Katherine Gorge National Park, 30 July 1994. **Western Australia**: 1 ♀, pool Silent Grove spring, The Kimberley, 11 September 1998; 3 ♂, pool Galvans Gorge, The Kimberley, 12 September 1998; 2 ♂, 6 ♀, plunge pool Adcock Gorge, The Kimberley, 12 September 1998; 2 ♂, 4 ♀, pool Manning Gorge Falls, The Kimberley, 13 September 1998; 4 ♂, 6 ♀, plunge pool Emma Gorge, The Kimberley, 16 September 1998; 1 ♀, pool Amalia Gorge, El Questro Station, The Kimberley, 16 September 1998; 2 ♀, pool Spillway Creek near Lake Argyle, 20 September 1998; 3 ♂, 1 ♀, pool west of Tunnel Creek, Tunnel Creek National Park, The Kimberley, 30 September 1998.

Remarks

The species has been reported previously from Tasmania and New South Wales. The new records from tropical North and North-west Australia represent therefore a considerable range extension. Unlike the two other known species of the genus, *D. boultoni* inhabits standing waters.

Cook (1986) based his description of the female on one specimen only. Therefore, I will give some additional measurements: body 902–1380 long and 650–1056 wide; I-leg-5 407–485 long, I-leg-6 233-291 long.

Aspidiobates Lundblad

Aspidiobates Lundblad, 1941: 115.

Aspidiobates scutatus Lundblad

Aspidiobates scutatus Lundblad, 1941: 115; Cook, 1986: 104; Harvey and Cook, 1988: 57; Smit, 1992: 99; Harvey, 1998: 139.

Material Examined

Australia: Victoria: 1 ♀, Eurobin Creek, at entrance Mt Buffalo National Park, 11 October 1997; 1 ♂, Croajingolong National Park, 23 October 1997; 1 ♂, 3 ♀, unnamed creek W of Secret Beach, Mallacoota, 23 October 1997.

Description

Dorsal shield of male 643 (658–767) long and 572 (586–672) wide (in brackets data from literature). In contradiction to Cook (1986), a male in my collection has the glandularia of the fourth coxal plates shifted to anterior suture line of third coxal plates. However, in the holotype as illustrated by Lundblad (1947) these glandularia are not shifted anteriorly. Apparently there is much variation in the position of these glandularia. Dorsal shield of female 776 (805–914) long and 679 (718–755) wide.

Remarks

A. scutatus has been reported from Tasmania, Victoria, New South Wales and Queensland.

Aspidiobates geometricus Cook

Aspidiobates geometricus Cook, 1986: 106; Harvey and Cook, 1988: 57; Smit, 1992: 96; Harvey, 1998: 139.

Material Examined

Australia: Victoria: 2 ♂, 4 ♀, Eurobin Creek, at entrance Mt Buffalo National Park, 11 October 1997.

Description

Dorsal shield of ♂ 563–572 (623–638) long and 504–534 (568–593) wide; dorsal shield of ♀ 558–660 (668–699) long and 529–631 (616–638) wide (in brackets data from Cook, 1986).

Remarks

Reported previously from New South Wales, Queensland and Victoria.

Aspidiobates pilbara Harvey

Aspidiobates pilbara Harvey, 1988: 201; Harvey, 1998: 139.

Material Examined

Australia: Western Australia: 16 ♂, 7 ♀, stream originating in Chinderwariner Pool, Millstream-Chichester National Park, 15 August 1994. **Northern Territory**: 4 ♂, 1 ♀, Baboalba Springs (Gubarra), Kakadu National Park, 20 July 1994; 1 ♀, South Alligator River, 11 km E of Gunlom, Kakadu National Park, 26 July 1994.

Description

Male

Dorsal shield 553–626 long and 475–514 wide for males from Western Australia, 535–539 and 462 respectively for males from Northern Territory.

Female

Dorsal shield 679–728 long and 572–616 wide for females from Western Australia, 559–648 and 474–543 respectively for the females from Northern Territory.

Remarks

So far, the species is only known from the Pilbara region in Western Australia. The new records from Northern Territory are therefore a considerable range extension of the species. The type-locality ("Lily Pond/Crystal Pool") of the species is in the Millstream-Chichester National Park, and might be

the same location as the Chinderwariner Pool. In a number of very young specimens (males as well as females) the dorsal shield is still undivided.

Aspidiobates wittenoom Harvey
Figures 29–30

Aspidiobates wittenoom Harvey, 1988: 204; Harvey, 1998: 139.

Material Examined
Australia: Western Australia: 3 ♀, wet wall near Circular Pool, Hamersley Range National Park, 12 August 1994; 1 ♂, Circular Fool, Hamersley Range National Park, 12 August 1994.

Description
Female

Dorsal and ventral shields present. Dorsal shield 587 long and 485 wide. Dorsal shield with one large anterior platelet and four smaller posterior platelets (Figure 29). Large platelet 533, anterior small platelet 206 and posterior small platelet 202 in length. Large platelet with two pairs of glandularia, distance of posterior pair much larger than distance of anterior pair. Ventral shield 650 long and 572 wide. Genital field with four pairs of acetabula (Figure 30). Genital field 165 wide, gonopore 130 long. In the illustrated female one acetabulum is missing. Lengths of PI-PV: 22, 108, 90, 144, 44; palp as in male. Lengths of I-leg-4-6: 198, 202, 148. Lengths of IV-leg-4-6: 152, 140, 120.

Remarks
The female of the species had not previously been described. Harvey (1988) suspected *A. pilbara* and *A. wittenoom* to be sister-species, which can be confirmed now the female of *A. wittenoom* is known. The type-locality of *A. wittenoom*, which was the only known locality so far, is also in the Hamersley Range.

Gondwanabates Imamura

Gondwanabates Imamura, 1984: 64.

Remarks
So far, the genus *Gondwanabates* has only been reported from eastern Australia. The record presented in this paper is the first for the Northern Territory.

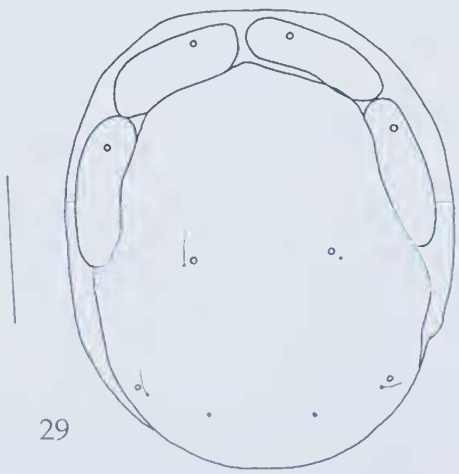
Gondwanabates bodivus Cook
Figures 31–34

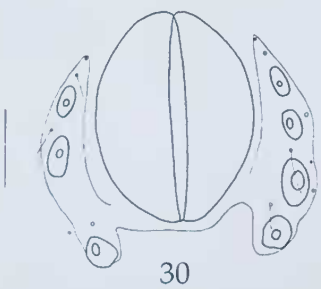
Gondwanabates bodivus Cook, 1986: 115; Harvey, 1998: 140.

Material Examined
Australia: Northern Territory: 2 ♀, South Alligator River, 11 km east of Gunlom, Kakadu National Park, 26 July 1994.

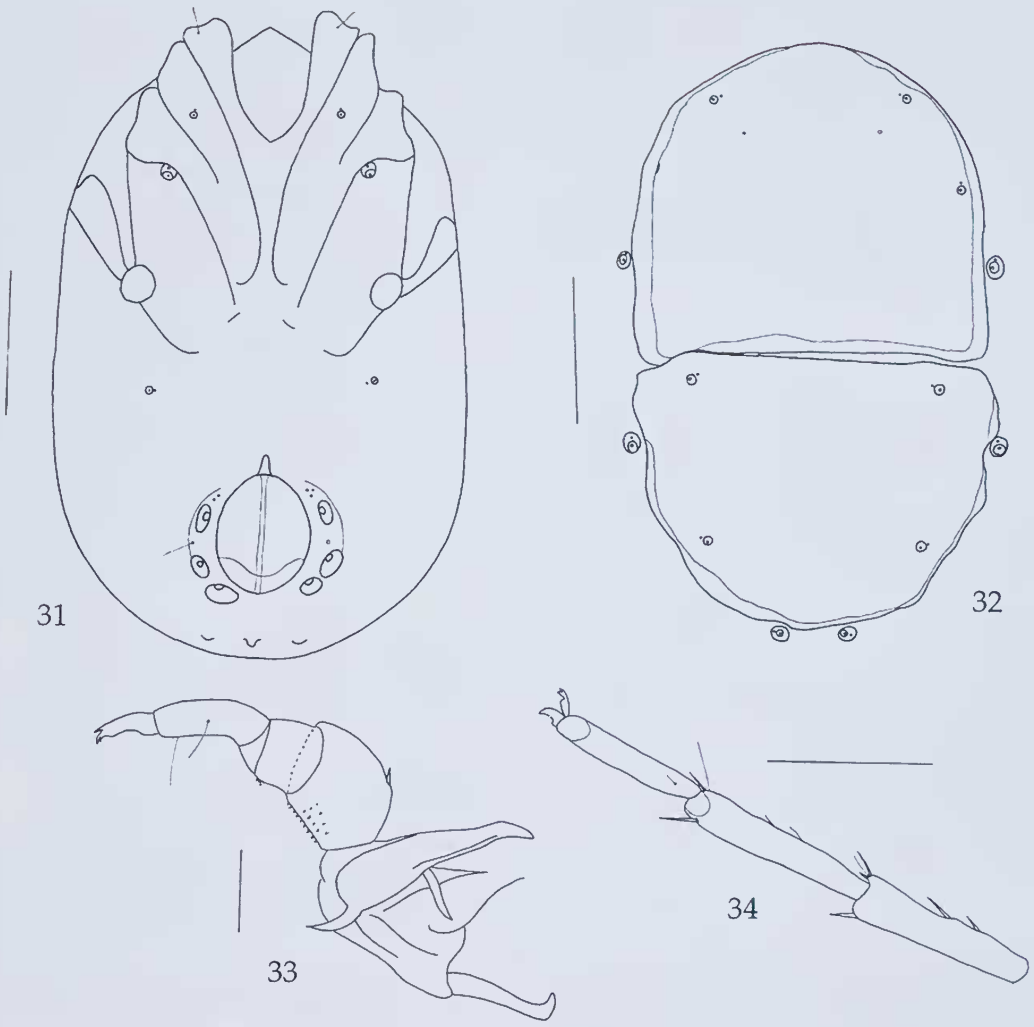
Description
Female

Dorsal and ventral shields present. Dorsal shield 407 (436) long and 252 wide. Anterior dorsal plate 216 (226) long, posterior dorsal plate 180 (175) long (Figure 31). Ventral shield 446 (475) long and 301 (301) wide. Capitulum, including anchoral process,





Figures 29–30 *Aspidiobates wittenoom* ♀: 29, dorsal view; 30, genital field. Scale lines = 50 µm (Figure 30), 200 µm (Figure 29).



Figures 31–34 *Gondwanabates bodivus*: 31, ventral view; 32, dorsal view; 33, palp + capitulum; 34, I-leg-4-6. Scale lines = 100 µm (Figures 31, 32, 34), 50 µm (Figure 33).

158 long; anchoral process relatively short. Genital field 112 wide, gonopore 84 long. Three pairs of acetabula (Figure 31). Lengths of PI-PV: 22, 82, 34, 70, 36; PIV with ventrally a ridge. Ventral margin of PII straight; PII with numerous small tubercles, PIII with fewer tubercles (Figure 33). Lengths of I-leg-4-6: 108, 116, 83 (Figure 34). Lengths of IV-leg-4-6: 116, 120, 100.

Remarks

Cook (1986) described only the male of *G. bodivus*. With the key provided by Cook (1986) the females are assigned to *G. bodivus*. The following combination of characters is diagnostic: posterior dorsal plates wider than long and with two pairs of glandularia, relative short anchoral process, palp of normal shape and I-leg-4 not enlarged. The species has previously been reported only from Queensland, so the new record represents a considerable range extension.

Caenobates K.O. Viets

Caenobates K.O. Viets, 1978b: 84.

Caenobates acheronius K.O. Viets

Caenobates acheronius K.O. Viets, 1978b: 84; Cook, 1986: 119; Smit, 1992: 99; Wiles, 1997b: 409; Harvey, 1998: 140.

Material Examined

Australia: Northern Territory: 1 ♂, Douglas River, at Douglas Hot Springs, 1 August 1994.

Description

Male

Dorsal shield 466 long and 359 wide. Ventral shield 572 long and 402 wide. Lengths of PII-PV: 72, 84, 80, 34. PII with short and broad distoventral projection; PIV with serrated ventral ridge, PIV relatively short.

Remarks

The male from the Northern Territory is smaller than the males from eastern Australia, and the ventral projection of PII is broader. According to Wiles (1997a) in the specimens from New Guinea the glandularia L4 and V4 are close together, lateral of the genital plate. In my specimen the two glandularia are closer compared to the eastern specimens, but not lateral of the genital plate.

Caenobates acheronius is known from Australia and New Guinea. Within Australia the species has been reported from Tasmania, Victoria, New South Wales and Queensland. The record presented here is the first for the Northern Territory, and fits well in the distribution pattern.

Kallimobates K.O. Viets

Kallimobates K.O. Viets, 1978b: 81.

Kallimobates australicus K.O. Viets

Kallimobates australicus K.O. Viets, 1978b: 81; Imamura, 1984: 66; Cook, 1986: 121; Harvey, 1998: 140.

Kallimobates cooki Smit, 1992: 99: Harvey, 1998: 140. **New synonymy.**

Material Examined

Paratype of Kallimobates cooki *Smit*

♀, Creek at Elabama Falls, Lamington National Park, Queensland, 18 July 1989, leg. H. Smit (ZMAN).

Other Material

Australia: Tasmania: 6 ♀, Douglas River, at crossing with Tasman Highway, 20 October 1997. **Victoria:** 4 ♂, 35 ♀, Ovens River at Porepunkah, 9 October 1997; 4 ♂, 13 ♀, Buckland River at crossing with Buckland Valley Road (west of Bright), 11 October 1997; 3 ♀, Eurobin Creek at park entrance, Mt Buffalo National Park, 11 October 1997; 1 ♂, 4 ♀, West Kiewa River, 11 km upstream of Mount Beauty, upstream of power station, 12 October 1997.

Description

Dorsal shield of male 495–621 long and 466–553 wide, of female 689–740 long and 592–650 wide.

Remarks

Cook (1986) stated that PIII has only a slight ventral projection. This was the reason for me to describe *K. cooki*, which has a distinct projection on PIII. However, it is clear that the shape of PIII is variable, and therefore *K. cooki* must be synonymized with *K. australicus*. Most of the females from this study have a distinct projection on PIII. Imamura (1984) also pointed out this phenomenon. Moreover, closer examination of the paratype of *K. cooki* revealed, that the capitulum is similar to that of *australicus*.

K. australicus is known from Tasmania, Victoria, New South Wales and Queensland.

Kallimobates vietsi Cook

Kallimobates vietsi Cook, 1986: 122; Harvey, 1998: 140.

Material Examined

Australia: Victoria: 2 ♀, West Kiewa River, 11 km upstream of Mount Beauty, upstream of power station, 12 October 1997.

Description

Dorsal shield 631–664 (653) long and 572–601 (593) wide.

Remarks

The species has previously been reported only from New South Wales and Victoria.

Rhynchaustrobates Cook

Rhynchaustrobates Cook, 1986: 123.

Rhynchaustrobates (Rhynchaustrobates) stylatus sp. nov.

Figures 35–36

Material Examined

Holotype

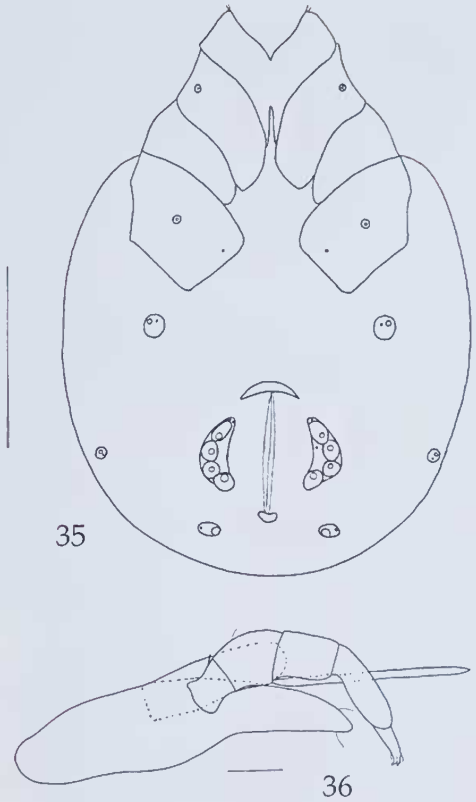
♀: MacKenzie River at Zumstein, Grampians National Park, Victoria, Australia, 1 October 1997 (NMV).

Paratype

Australia: Victoria: 1 ♀, same data as holotype (ZMAN).

Diagnosis

Extremely long cheliceral claw, four pairs of acetabula.



Figures 35–36 *Rhynchaustrobates stylatus*, holotype ♀: 35, ventral view; 36, palp + capitulum. Scale lines = 200 µm (Figure 35), 50 µm (Figure 36).

Description

Female

Body dorsally 563 (538) long and 456 (446) wide, ventrally 621 (601) long. Idiosoma soft, lineated and without ventral shield. Glandularia of dorsum not in plates; postocularia on relatively small platelets. Capitular bay V-shaped. Capitulum attached to a long, protrusile tube. Coxal plates extending far beyond anterior body margin. First coxal plates fused. Posterior margin of fourth coxal plates triangular. Four pairs of acetabula, genital field crescent-shaped (Figure 35). Chelicera 295 long, cheliceral claw straight, 180 long. Lengths of PI-PV: 29, 70, 53, 84, 37; PIII without ventral projection (Figure 36). Lengths of I-leg-4-6: 96, 118, 98. Lengths of IV-leg-4-6: 132, 161, 144.

Remarks

The new species shares the number of acetabula with *R. (Victoriabates) geometricus* Cook. However, *R. geometricus* has a ventral shield (absent in the new species), and large dorsal plates (small in the new species). The only other Australian species with a large and straight chelicere is *R. dividus* Cook. This last species has three pairs of acetabula and the first coxal plates are separated. The finding of the new species implicates that the diagnosis of the typical subgenus must be amended: three or four pairs of acetabula present.

Etymology

Named for its long cheliceral claw.

THE DIVERSITY OF AUSTRALIAN WATER MITES

In his review on Australian water mites, Harvey (1998) reported 415 species of water mites. This is a relatively low number compared to Europe, with more than 900 species (Viets, 1978a), or to North America, where the number of species is estimated to be 1500 (Smith and Cook, 1991). However, Walter and Proctor (1998), in a study of water mites from tropical Australia, found that about 32% of the species they could compare with literature were undescribed. In the more tropical parts there were more undescribed species than in the more temperate parts. In the results published so far of my collections from northern and western Australia (Smit, 1996b, 1997, 1998a, 1998b, 1998c, present study), 69 species were identified, of which 42% were new to science. In my studies of water mites from eastern Australia (Smit, 1992, 1999, present study), only 22% of the species were new to science. This reflects the state of the art of Australian water mites, as most studies dealt with the eastern part of the country.

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